

4.1.2 Outline the mechanism of natural selection as a possible driving force for speciation.

Name _____

Class _____

Period _____

Changes in Bone Structures With Time

The changes in horses over the last 55 million years have been shown by studies of large numbers of fossils. The earliest kind of horse was small and had teeth that were adapted to browsing on young shoots of trees and shrubs. The present-day horse is much larger and has larger teeth that are adapted to grazing on the tough leaves of grasses. Early horses were adapted to living in wooded, swampy areas where more toes were an advantage. The single-hoofed toes of the present-day horse allow it to travel fast in the plains.

1. Examine the diagrams in Figure 2. They show fossils of the front foot bones and the teeth of horses. The foot bones at the upper right of each diagram indicate the relative bone sizes of each kind of horse.

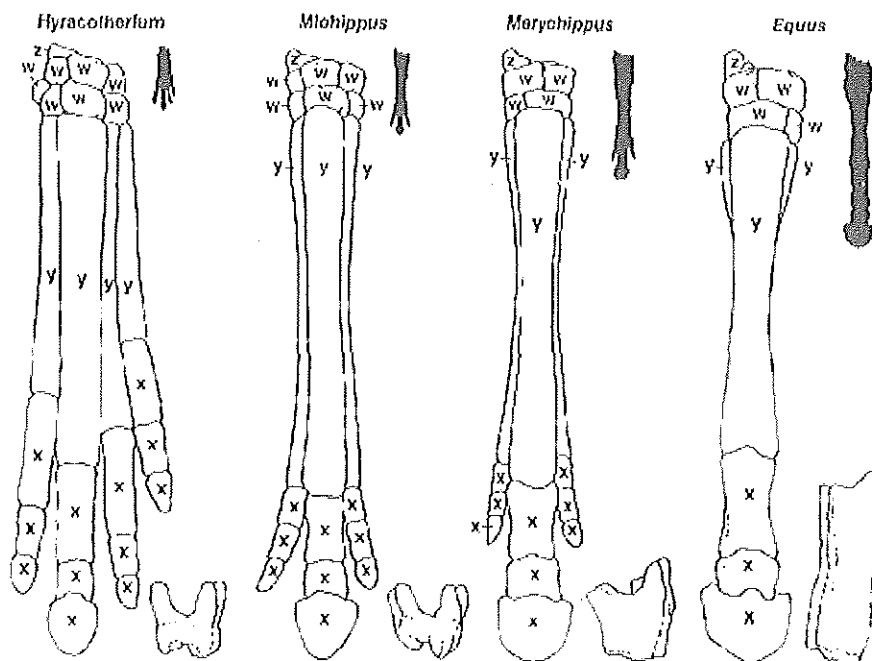


FIGURE 2. Forefoot bones and teeth of horses

teeth

2. Look for and color the following kinds of bones for each fossil horse.
 - a. Color the toe bones red, these are marked for you with an x.
 - b. Color the foot bones blue, these are marked with a y.
 - c. Color the ankle bones green, these are marked with a w.
 - d. Color the heel bones yellow, these are marked with a z.
3. Using the diagrams in Figure 2, make measurements to fill in Table 2.

Table 2. Evolution of the Horse

Kind of horse	<i>Hyracotherium</i>	<i>Miohippus</i>	<i>Metachippus</i>	<i>Equus</i>
Number of toes				
Number of toe bones				
Number of foot bones				
Number of ankle bones				
Number of heel bones				
Total number of foot bones				
Length of foot (mm)				
Height of teeth (mm)				

QUESTIONS

1. What changes occurred in the surroundings of horses from *Hyracotherium* to *Equus*?
2. What change occurred in the shape of the horse from *Hyracotherium* to *Equus*?
3. What changes occurred in the size of the horse from *Hyracotherium* to *Equus*?
4. As the surroundings changed, what happened to the teeth of the horse?
5. Describe the overall changes in foot length, number of toes, and size of toes in the horse over time.
6. How would natural selection have caused changes in the size, feet, and teeth of the horse?